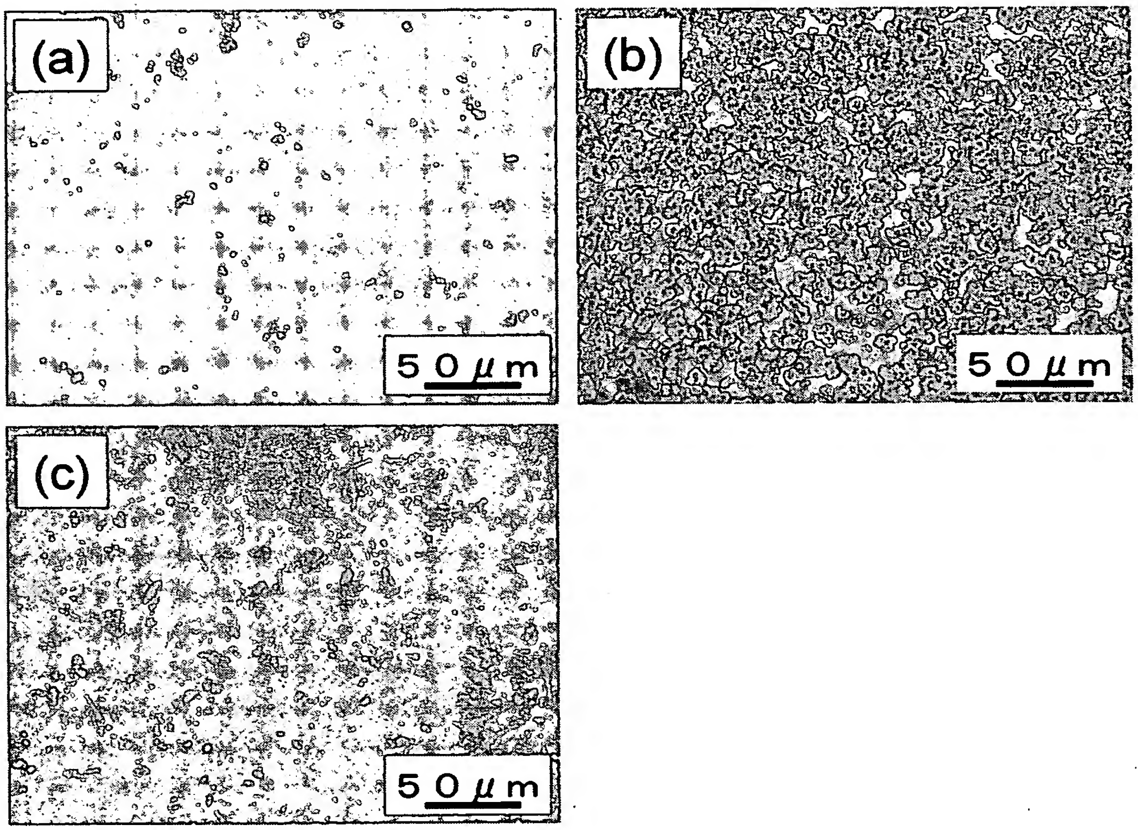
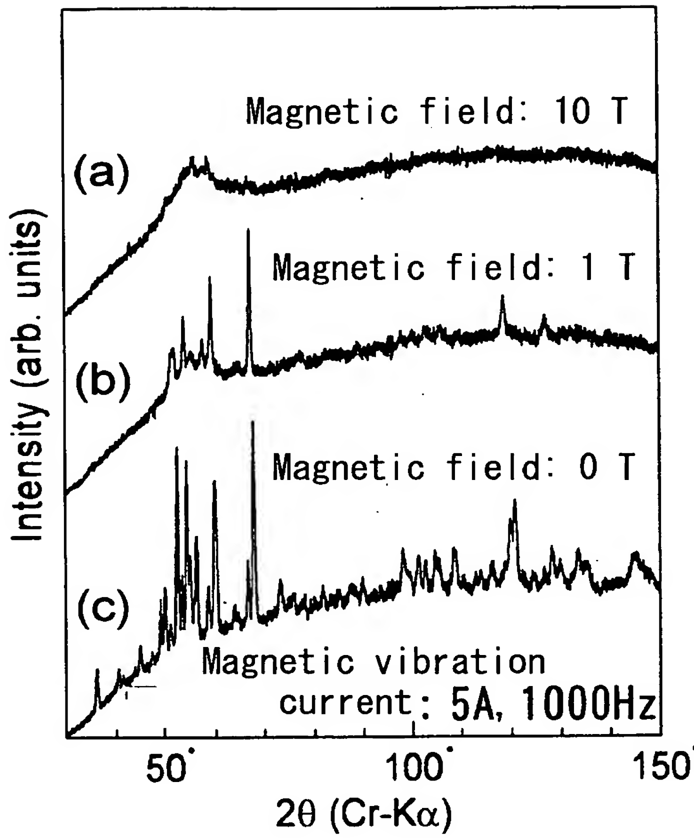


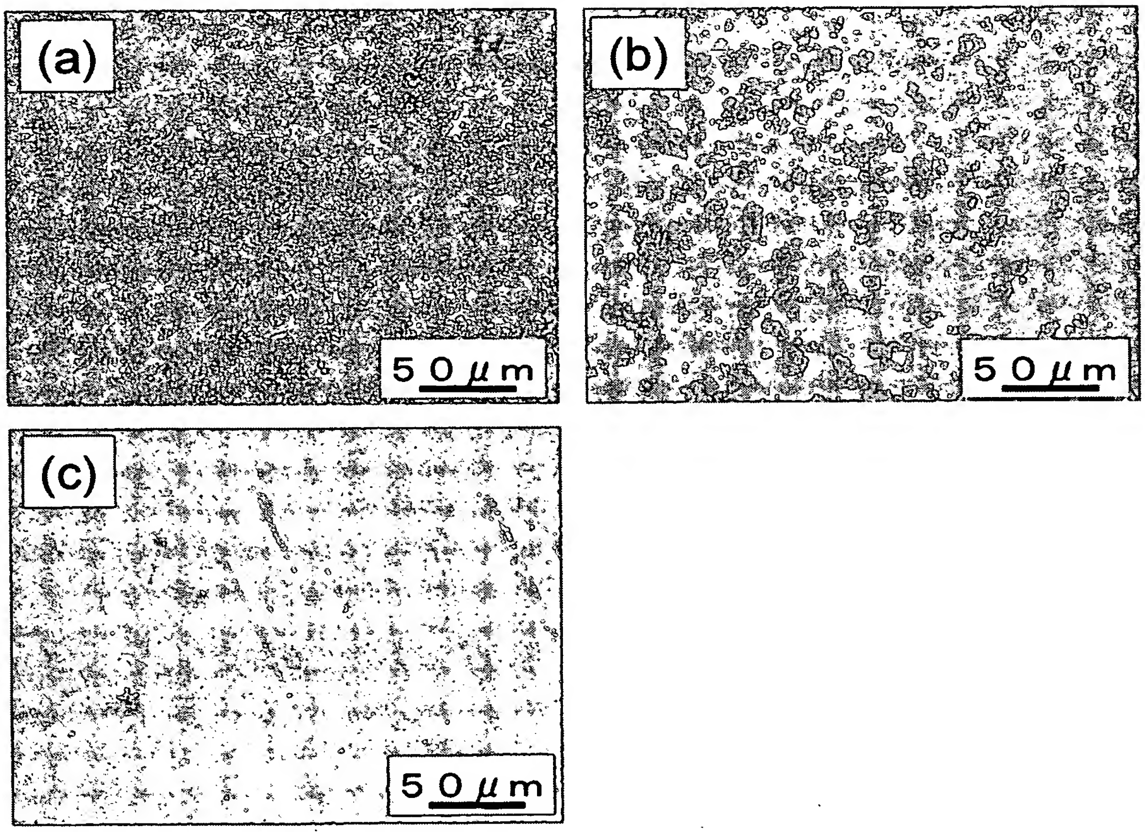
Changes in phase occurrence due to electromagnetic vibrating force (electromagnetic vibration current: 5 A, 1000 Hz, magnetic field: (a) 10 T, (b) 1 T, (c) 0 T, holding container: Mo foil)

Fig. 1



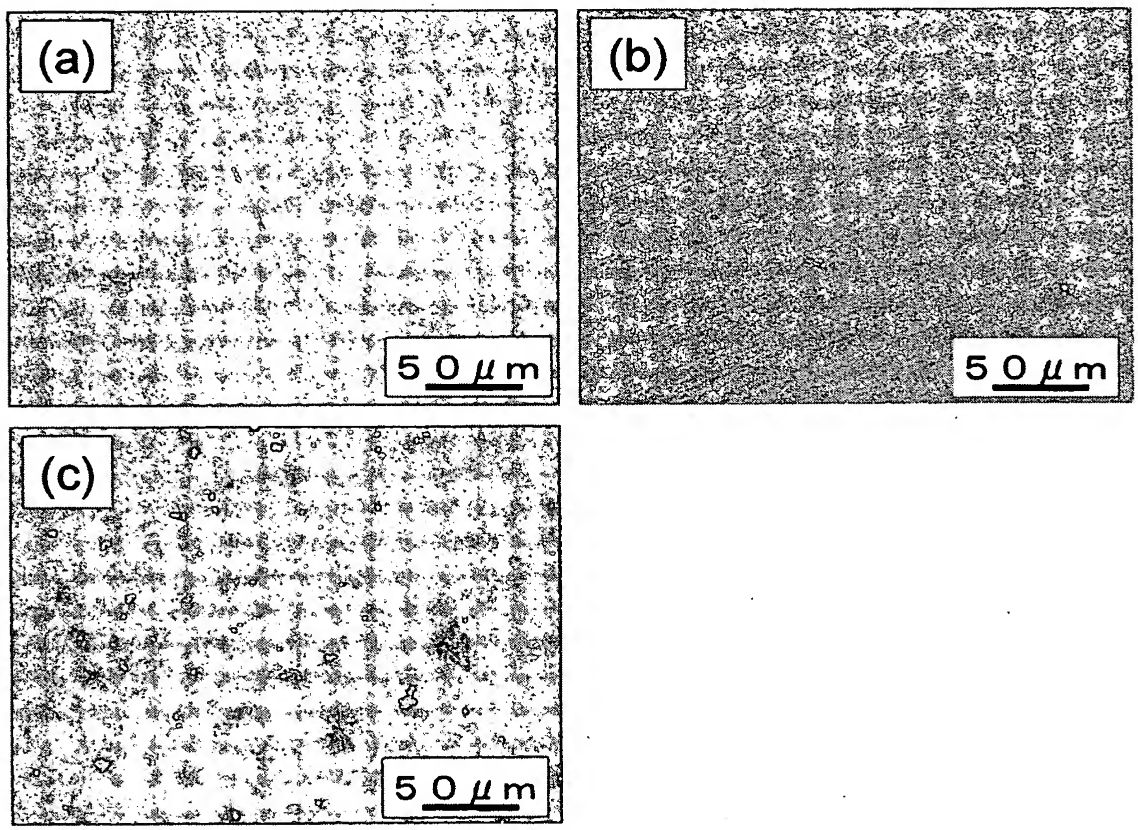
Changes in XRD due to electromagnetic vibrating force (electromagnetic vibration current: 5 A, 1000 Hz, magnetic field: (a) 10 T, (b) 1 T, (c) 0 T, holding container: Mo foil)

Fig. 2



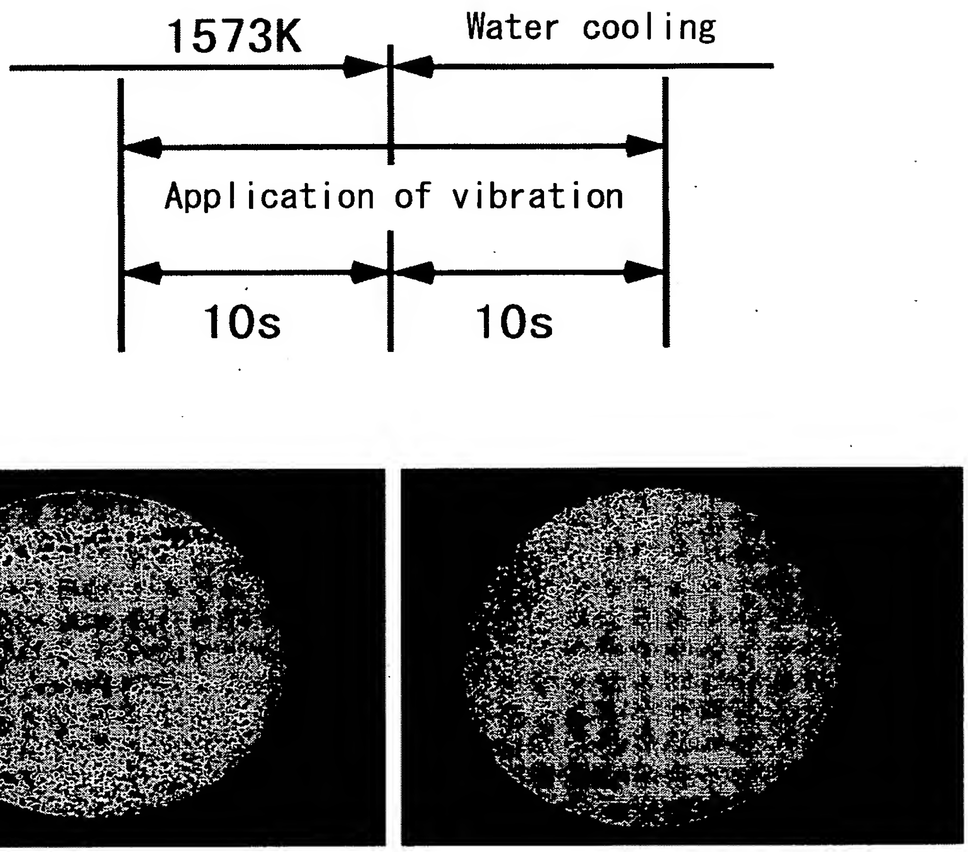
Changes in phase occurrence due to electromagnetic vibrating force (electromagnetic vibration current: 5 A, (a) 100 Hz, (b) 1000 Hz, (c) 5000 Hz, holding container: alumina tube)

Fig. 3



Changes in phase occurrence due to electromagnetic vibrating force (electromagnetic vibration current: 5 A, 5000 Hz, magnetic field: (a) 10 T, (b) 5 T, (c) 2 T, holding container: alumina tube)

Fig. 4



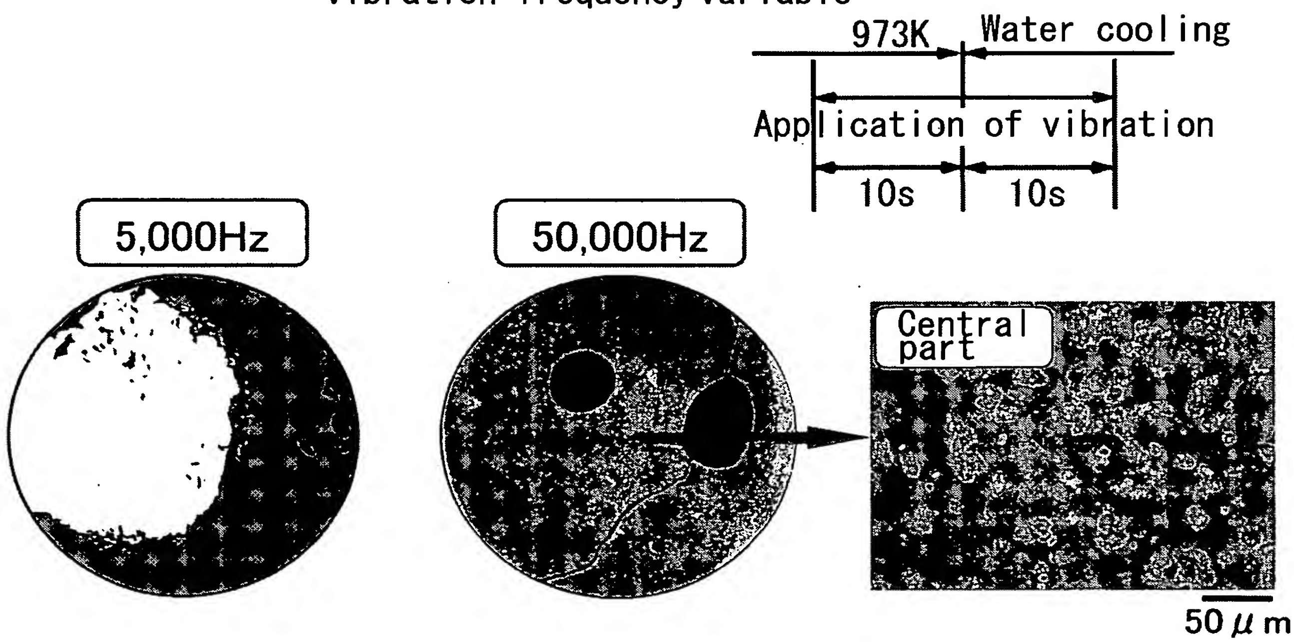
0T　　　　　　　　10T

$(Fe_{0.6}Co_{0.4})_{72}Si_4B_{20}Nb_4$ alloy
(black spots represent crystal phase)

Effects of electromagnetic vibration in iron alloy
Vibration application current: 5 A, 5000 Hz

Fig. 5

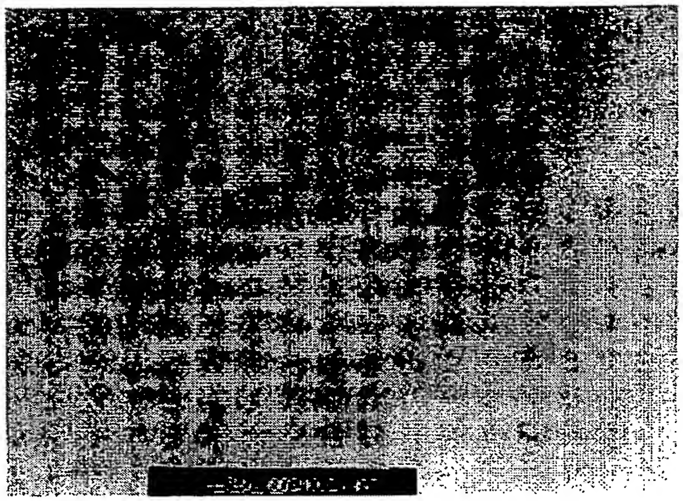
・Vibration application current: 20A, magnetic flux density: 10 T
Vibration application current frequency -->
vibration frequency variable



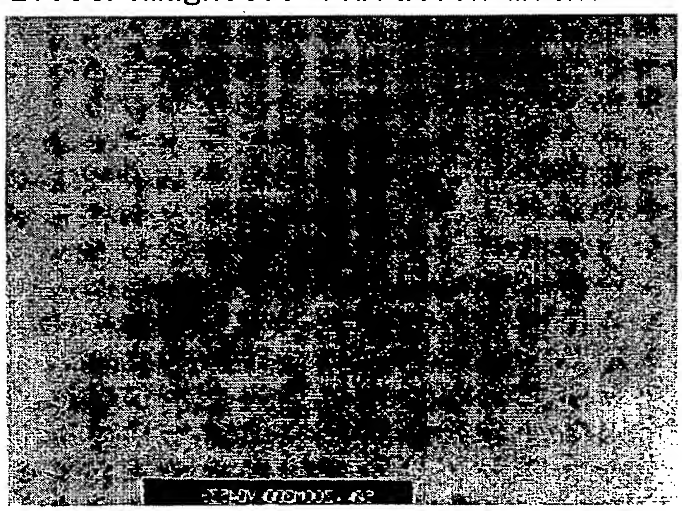
Darkish parts: mainly metal glass phase

Fig. 6

Rapid solidification method



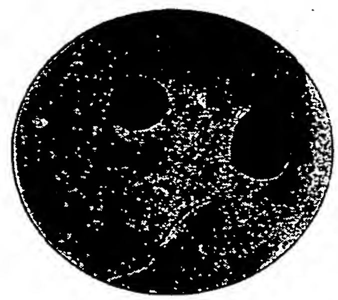
Electromagnetic vibration method



0.2μm

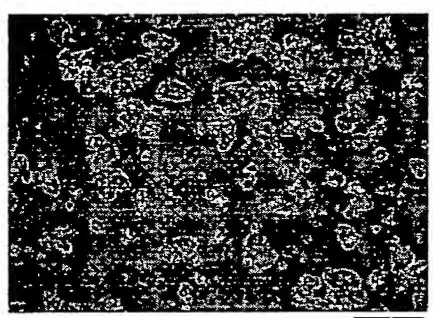
Fig. 7

Rapid solidification method



Electromagnetic vibration method

(Darkish parts: metal glass, white parts: crystals)

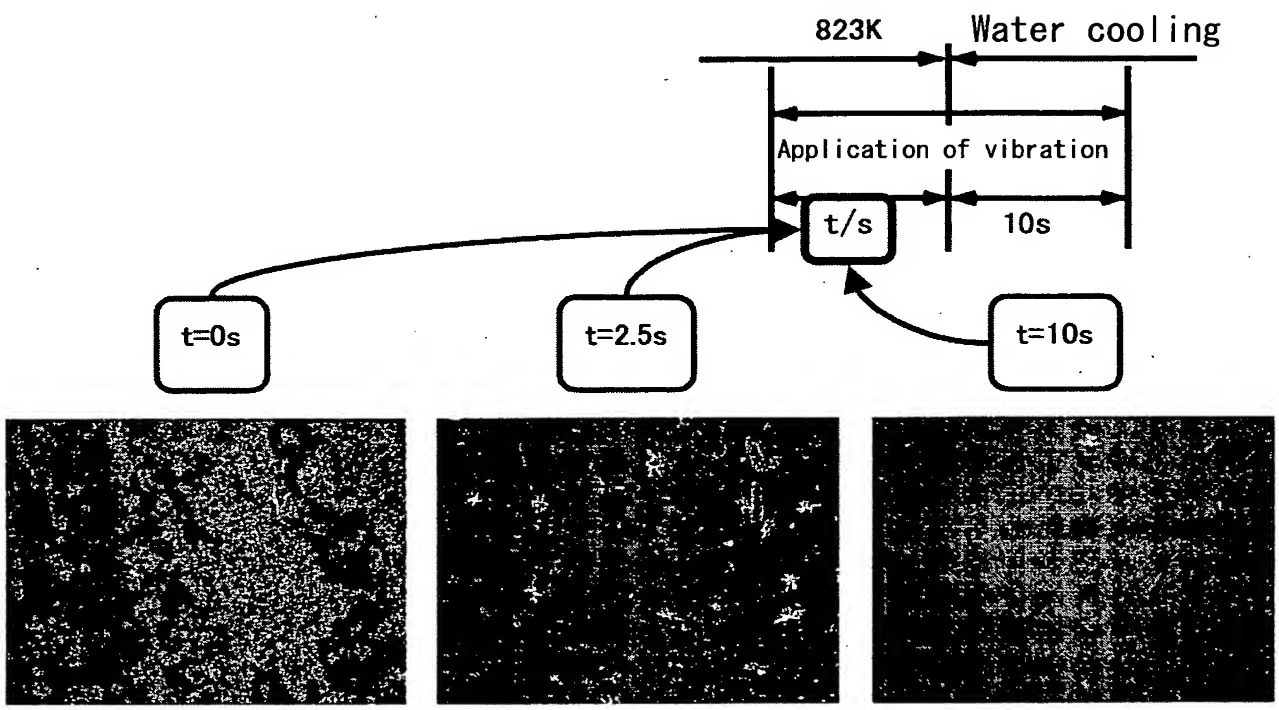


50 μm

Electromagnetic vibration method
(enlargement)

Texture structures of metal glasses obtained by rapid solidification and electromagnetic vibration

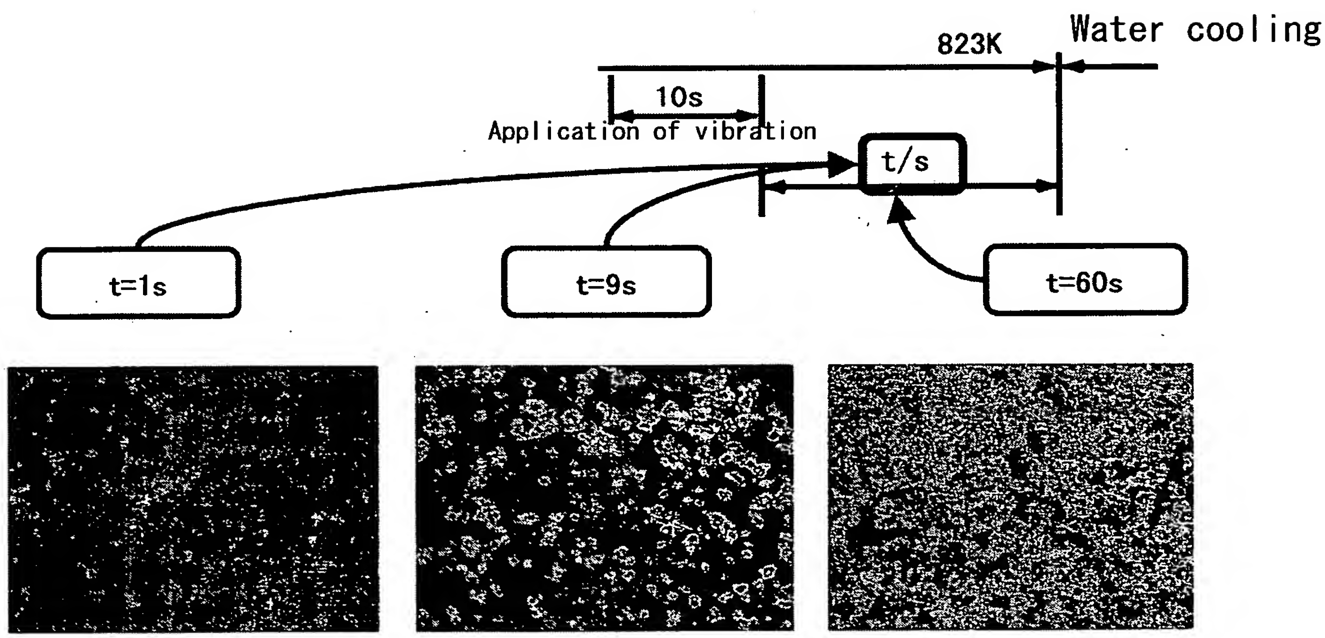
Fig. 8



Effects of electromagnetic vibration application time at the liquid stage before solidification

Vibration application current: 5 A, 5,000 Hz,
magnetic flux density: 10 T

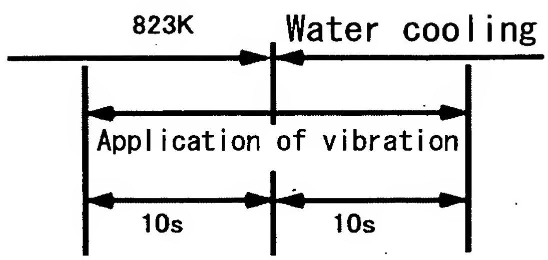
Fig. 9

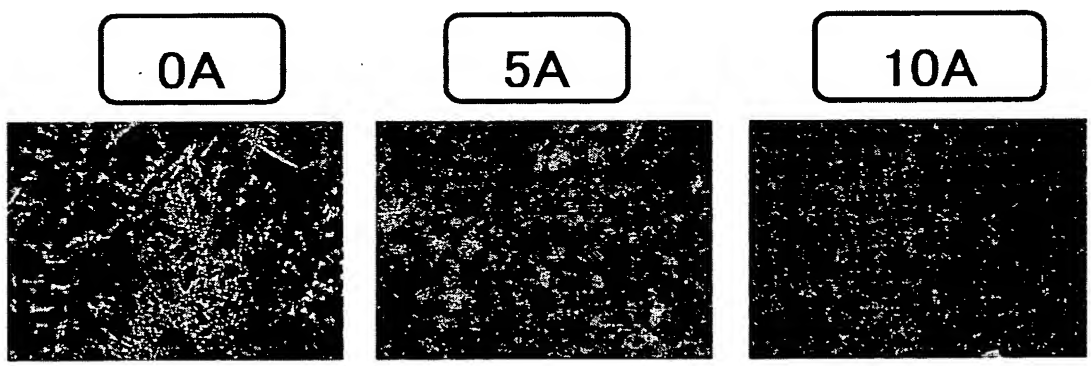


Effects of non-vibrating retention time after application of electromagnetic vibration in the liquid state

Vibration application current: 5 A, 5,000 Hz, magnetic flux density: 10T

Fig. 10





Effects of applied current strength of electromagnetic vibration

Applied current frequency: 1,000 Hz, magnetic flux density: 10 T
Applied current density variable

Fig. 11